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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/583,411

06/04/2007

Hideki Fujii

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10/12/2011

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP
1250 CONNECTICUT AVENUE, NW
SUITE 700
WASHINGTON, DC 20036

EXAMINER

JOYCE, WILLIAM C

ART UNIT

PAPER NUMBER

3656

NOTIFICATION DATE

DELIVERY MODE

10/12/2011

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentmail@whda.com

Office Action Summary	Application No. 10/583,411	Applicant(s) FUJII ET AL.	
	Examiner WILLIAM C. JOYCE	Art Unit 3656	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 2 and 6-11 is/are pending in the application.
- 5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 2 and 6-11 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

This Office Action is in response to the amendment filed August 11, 2011 for the above identified patent application.

Claim Objections

1. The claims are objected to because they include reference characters which are not enclosed within parentheses. Specifically, the character "n" (claim 6) must be enclosed within parentheses.

Reference characters corresponding to elements recited in the detailed description of the drawings and used in conjunction with the recitation of the same element or group of elements in the claims should be enclosed within parentheses so as to avoid confusion with other numbers or characters which may appear in the claims. See MPEP § 608.01(m).

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 2 and 6-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- a. Claim 6, line 17, the limitation "the ball return passages" lacks proper antecedent basis.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2 and 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Honma (JP 09-229064) in view of Komata (JP 06-241228).

Referring to the embodiment of Figure 8, Honma illustrates a ball spline comprising: a spline shaft having a substantially circular sectional configuration, and having in the outer peripheral surface thereof a plurality of lines of longitudinally extending arcuate torque transmission grooves (7) arranged at equal intervals, with the ball rolling faces being formed on side surfaces of land parts situated in between the torque transmission grooves, such that the ball rolling faces are on both sides in the width direction of each torque transmission groove; and a spline nut formed substantially as a cylinder with a hollow hole into which the spline shaft is fitted, having on an inner peripheral surface of the hollow hole a plurality of lines of load rolling faces (2) which are adjacent in the circumferential direction opposed to the ball rolling faces of the spline shaft; a

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large number of balls (9) rolling while receiving a load in the load region formed whereby the ball rolling faces of the spline shaft and the load rolling faces of the spline nut are opposed to each other; the spline nut has first ball retaining portions (53), formed of synthetic resin, which are protruded from the inner peripheral surface of the spline nut, each of the first ball retaining portions is accommodated in the torque transmission groove, and is disposed between a pair of rows of balls rolling on the ball rolling faces on both sides of each of the torque transmission grooves; the spline nut has second ball retaining portions (16), formed of synthetic resin, the second ball retaining portions formed into part of the inner peripheral surface of the spline nut, the first ball retaining portion and the second ball retaining portion are disposed on both sides of the load rolling faces of the spline nut; the spline nut has an endless circulation path for circulating balls, and the balls arranged in a row on a coupling belt (70) formed of a flexible synthetic resin to be inserted into the endless circulation path together with the coupling belt, guide grooves for guiding the coupling belt are axially formed in the first ball retaining portions and the second ball retaining portions.

Honma does not teach the width of the lands being sized such that the distance between a pair of rows of balls rolling on the ball rolling faces situated on both sides of each of the land parts is set larger than the distance between a pair of rows of balls rolling on the ball rolling faces on both sides of each of the torque transmission grooves.

The prior art to Komata illustrates (Fig. 2) a roller spline comprising: a spline shaft (1) having a plurality of lines of rolling faces extending in a longitudinal direction; and a spline nut (5) formed substantially as a cylinder with a hollow hole into which the spline shaft is fitted, having on an inner peripheral surface of the hollow hole load rolling faces opposed to the rolling faces of the spline shaft, and being assembled to the spline shaft through a large number of rollers (21), and in that the spline shaft has a substantially circular sectional configuration and has in its periphery a plurality of lines of longitudinally extending torque transmission grooves arranged at equal intervals, with the rolling faces being formed on side surfaces of land parts situated between the torque transmission grooves, that is, on both sides in the width direction of each torque transmission grooves; and the distance between a pair of rows of rollers rolling on the rolling faces situated on both sides of each of the land parts is set larger than the distance between a pair of rows of rollers rolling on the rolling faces on both sides of each of the torque transmission grooves.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the width of each land disclosed by Honma, such that the distance between a pair of rows of balls rolling on the ball rolling faces situated on both sides of each of the land parts is set larger than the distance between a pair of rows of balls rolling on the ball rolling faces on both sides of

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each of the torque transmission grooves, as taught by Komata, motivation being to provide a smooth operating bearing device with a particular operating capacity for a particular application.

With respect to the newly added limitation of claim 6, Honma illustrates the spline nut having the ball return passages which are formed parallel to the load regions, and are situated in the contact normals (n) of the balls and the ball rolling faces. Alternatively, Komata illustrates the spline nut having the ball return passages which are formed parallel to the load regions, and are situated in the contact normals (n) of the balls and the ball rolling faces.

Allowable Subject Matter

6. Claim 11 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed August 11, 2011 have been fully considered but they are not persuasive.

Applicant argues Honma does not show the ball return passages situated in the contact normals n of the balls and the ball rolling faces. This argument is not persuasive because Figure 8 illustrates a vertical line passing through the center of the

spline shaft, a second line intersecting with the vertical line and forming an angle α , the second line defining the contact normals (n) of the balls and the ball rolling faces, wherein the ball return passage is situated in the second line.

Alternatively, Komata illustrates the spline nut having the ball return passages which are formed parallel to the load regions, and are situated in the contact normals (n) of the balls and the ball rolling faces.

The arguments based on Teramachi (USP 4,127,309) are moot because the claim rejection has been withdrawn.

The arguments based on Honma and Komata are not persuasive and the claims stand rejected as described above.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM C. JOYCE whose telephone number is (571)272-7107. The examiner can normally be reached on Monday - Thursday 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on (571) 272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/WILLIAM C JOYCE/
Primary Examiner, Art Unit 3656